

# 232      CONDENSERS    AND    COOLING    TOWERS

The heat transmitted per hour

or, S

$$\left( \frac{K \cdot A}{L} \right)$$

Sectional area through tubes available for water flow

$$n \frac{\pi}{4} D^2 \quad \text{sq. ft.}$$

$$\therefore 3600 \text{ W} \quad \frac{4 \times 144}{\pi} f$$

or n

$$\frac{4 \times 144 \times W}{3600 \times \pi \times D^2}$$

$$\text{But, S} = \frac{(a \cdot L)}{\pi D^2} \text{ sq. ft.,}$$

$$\frac{0.7 \times 10^6}{\pi D^2} \text{ or } \frac{1.2 \times 10^6}{\pi D^2} \text{ ft.}$$

Or, inserting for value of //,

$$\frac{128}{4 \times 144 \times W}$$

For example, taking the conditions given in the calculation on p. 231, where  $T_s = 105^\circ \text{ F.}$ ,  $T_c = 76^\circ \text{ F.}$ ,  $T_m = 95^\circ \text{ F.}$  and taking  $W = 20,000 \text{ Ib.}$  of exhaust steam per hour,  $K = 600$ ,  $L = 5 \text{ ft.}$  per second,

$$\text{then, } S = \frac{95 - 76}{1000 \times 600 \times 5} \times 20,000 = 1.0647 \times 10^6 \text{ sq. ft.}$$

From the example on p. 231,

$$\begin{aligned} W &= 50 \times 20,000, \\ &= 1,000,000 \text{ Ib. per hour.} \\ S &= \frac{1000 \times 10^6}{600 \times 18} \\ &= 1760 \text{ sq. ft.} \end{aligned}$$

Assuming the condenser has 3 passes, and the tubes  $\frac{1}{2}$  in. outside diameter, and, say, 0.65 in. diameter inside,